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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,767	03/06/2002	Shuji Nakamura	HITA.0181	8532

7590 02/22/2005

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EXAMINER	
COFFY, EMMANUEL	
ART UNIT	**PAPER NUMBER**
2157	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/090,767	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Emmanuel Coffy	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6 and 9-11* is/are rejected.

7)☒ Claim(s) *5,7 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10 Feb 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the application filed on 02 June 2002. Claims 1-11 are pending. Claims 1-11 are directed to a "clustering Disk Controller, its Disk Control Unit and Load Balancing Method of the Unit."

Oath/Declaration

2. The oath is objected to as being informal. It lacks authentication by a diplomatic or consular officer of the United States; 37 CFR 1.66(a). This informality can be overcome by filing either a declaration under 37 CFR 1.68, or a new properly authenticated oath under 37 CFR 1.66. The new oath or declaration must properly identify the application of which it is to form a part, preferably by application number and filing date in the body of the oath or declaration. See MPEP §§ 602.01 and 602.02.

Claim Objections

3. Claims 5, 7 and 8 are objected to for being dependent upon rejected claims 1 and 6 respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art ("hereinafter admission") in view of Mitchem et al. (US 6,804,245.)

Claim 1:

Admission discloses a clustering disk controller comprising a plurality of disk control units, (See Fig. 2 of disclosure (10))

connection means which connects said plurality of disk control units, (See Fig. 2 of disclosure (2))

channel control units installed in said disk control units, (See Fig. 2 of disclosure (11))

a switch installed in said clustering disk controller and connected to said channel control units and host computers; (See Fig. 2 of disclosure (39).)

Admission lacks or does not expressly disclose a data table for holding correspondence information between a destination channel control unit which is an access destination set by said host computer and a channel control unit which actually transfers said access request.

Mitchem teaches a control route table (Fig. 1 (110)) coupled to a plurality of fibre channel ports. The control route table is operative for providing a single routing table to the pluarality of ports, which provides association data (i.e. correspondence information.) The association data is the association between destination identification and a corresponding port. (See col. 4, lines 18-26.)

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the route table disclose by Mitchem to obtain simplification of traffic management contributing to a more cost efficient and ultimately a more accurate system.

Claim 2:

Admission discloses a clustering disk controller comprising a plurality of disk control units, (See Fig. 2 of disclosure (10))

connection means which connects said plurality of disk control units, (See Fig. 2 of disclosure (2))

channel control units installed in said disk control units, (See Fig. 2 of disclosure (11))

a switch installed in said clustering disk controller and connected to said channel control units and host computers; (See Fig. 2 of disclosure (39).)

Admission lacks or does not expressly disclose a data table for holding information on whether or not to transfer data to a different channel control unit from the channel control unit which received the access request from said host computer.

Mitchem teaches a control route table (Fig. 1 (110)) coupled to a plurality of fibre channel ports. The control route table is operative for providing a single routing table for holding information on whether or not to transfer data to a different channel control unit from the channel control unit which received the access request from said host computer. (See col. 7, lines 28-46.)

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the single routing table disclosed by Mitchem to obtain simplification of traffic management contributing to a more cost efficient and ultimately a more accurate system.

Claim 4:

The clustering channel control unit as defined in claim 1, further comprising a service processor (SVP), which manages the information in the disk controller and modifies said data table. (See Fig. 3 of disclosure (40).)

Admission lacks or does not expressly disclose modification of data table. However, Mitchem teaches a control route table (Fig. 1 (110)) coupled to a plurality of fibre channel ports. The control route table is operative for providing a single routing table (See col. 7, lines 28-46.) (data table modification.)

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the data table modification disclosed by Mitchem to obtain simplification of traffic management contributing to a more cost efficient and ultimately a more accurate system.

Claim 6:

Admission discloses a control method of a disk subsystem, which comprises

a plurality of disk control units, (See Fig. 2 of disclosure (10))

connection means which connects said plurality of said disk control units, channel control units, and (See Fig. 2 of disclosure (2))

a switch equipped with a data table for transferring an access request from a host computer to the channel control units; the method comprising (See Fig. 2 of disclosure (39).)

Admission lacks or does not expressly disclose:

a step of transferring access request from the host computer to a predetermined channel control unit based on said data table,

a step of processing the access request, by the channel control units to which said access request is transferred, and

a step of sending, to the host computer, data indicating that the destination channel control unit specified as the destination of the access request from the host computer has replied to the access request.

Mitchem teaches the transfer, processing access request step and the sending step at col. 5, lines 60-66 and col. 7, lines 28-59.

Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the data table modification disclosed by Mitchem to obtain simplification of traffic management contributing to a more cost efficient and ultimately a more accurate system.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art ("hereinafter admission") in view of Mitchem et al. (US 6,804,245) in further view of Peters et al. (US 6,374,336.)

Claim 3:

The clustering disk controller as defined in claim 1, wherein plural channel control units can be specified as the destination of the access request from said host computer,

and said data table stores a probability that an individual channel control unit of said plural channel control units will be selected as a channel controller which actually forwards said access request.

The admission nor Mitchem discloses data table storing a probability that an individual channel control unit of said plural channel control units will be selected as a channel controller which actually forwards said access request. However, Peters teaches a probability distribution for selecting a storage unit at col. 7, lines 25-30.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission and the single routing table disclosed by Mitchem with the probalistic function disclosed by Peters to avoid the convoy effect by distributing the load.

6. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art ("hereinafter admission") in view of Mitchem et al. (US 6,804,245) in further view of Jones et al. (US 5,680,539.)

Claim 9:

The disk subsystem control method as defined in claim 6, wherein the disk subsystem comprises a service processor (SVP) which manages information in the disk controllers; (See Fig. 3 of disclosure (40).)

wherein said SVP looks up load information for the channel control units, and modifies said data table so that an access request from the host computer addressed to a channel control unit under heavy load, is transferred to a channel control unit under low load.

Neither the admission nor Mitchem discloses the SVP looks up load information for the channel control units. However, Jones teaches load balancing at col. 10, lines 9-15.

Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the load balancing disclosed by Mitchem to obtain higher performance and availability by allowing for higher speed and greater resistance to errors.

Claim 10:

The disk subsystem control method as defined in claim 9, wherein said SVP looks up fault information for the channel control units, and modifies said data table so that an access request from the computer addressed to a faulty channel control unit, is transferred to a normal channel control unit.

Neither the admission nor Jones discloses the SVP looks up load information for the channel control units. However, Mitchem teaches an exit port look-up table for an available port at col. 6, lines 8-37.

Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the exit look-up table disclosed by Mitchem contributing to better availability by yielding more reliable and fault-tolerant storage systems.

Claim 11:

The disk subsystem control method as defined in claim 9, wherein said SVP looks up load information for the channel control units, and modifies said data table so

that the processing level with respect to the channel control unit under low load is increased.

Neither the admission nor Jones discloses increasing the processing level for the channel control units. However, Mitchem teaches blocking traffic from certain receive ports to certain D_Ids at col. 6, lines 54-58. (the processing level of the unit can also be increased by blocking traffic to certain ports thereby decreasing the load.)

Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine Admission with the load reduction mechanism disclosed by Mitchem because it would contribute to better availability by yielding more reliable and fault-tolerant storage systems.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Coffy whose telephone number is (272) 272-3997. The examiner can normally be reached on 8:30 - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Coffy, Esq.
Patent Examiner
Art Unit 2157

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EC
Feb 10, 2005